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ABSTRACT

A technique for large-scale research in which researchers at different sites study the same problem in the same way at the same time is described. This "simultaneous replication" enhances the credibility of the replication process by eliminating variations in the use of time that can contaminate research results. A total of 144 replications were conducted in the Phi Delta Kappa study of students at risk using data from a larger sample of students attending 237 schools in 87 communities. In 1988, a manual of instructions was prepared to ensure replication. A 3-day training session used the manual as a text. Using the explicit instructions in the manual, researchers collected data in the fall of 1988. The data were analyzed in common ways to yield 237 multiple regression analyses, 144 of which were reported as information about students. In this large-scale study, the use of volunteers to collect data and the contributions of the expertise of professional educators made simultaneous replication possible. Study data suggest that: teachers know which students are at risk in their classrooms, and teachers attempt to provide special help to at-risk students. As a research methodology, simultaneous replication seemed well suited to school districts and professional organizations. Three tables present study data. (SLD)

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Simultaneous Replication: A Technique for Large-Scale Research

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Introduction

The purpose of this paper is to describe a research project that was conceptualized with the idea of replicating one study in various locations simultaneously: simultaneous replication.

"Simultaneous replication" refers to a way of working in which researchers at different sites study the same problem in the same way at the same time. In this report, researchers in 87 different communities used the same definitions, the same procedures, the same instruments, and collected data about the same problem according to the same time line. Finally, data from each site were analyzed in the same way. In other words, the same study was repeated many times.

Replication is an important concept in the history and theory of science. The dictionary defines replicate as "to duplicate, copy, or repeat." Simultaneous replication means to duplicate, copy, or repeat a research study several times within the same time period. Simultaneity is not as important as replication, but added to the idea of replication, it enhances credibility of the process by eliminating that which sometimes contaminates research results--variations in the use of time.

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Replication is important because it is the way scientists verify research results. If a scientist reports findings that other scientists cannot verify when they replicate the study, the original findings are questioned. If a scientist reports a study, however, and if other scientists use the same definitions, procedures, and design and get the same results, then the findings in the first study are supported and people can have confidence in the results.

Replication is also important because it guarantees accountability. "If a researcher misrepresents the facts or even lies," the argument goes, "that person will be found out when the study is replicated."

Replication requires precise duplication of methods, instruments, and time lines if the concept is honored. That kind of precision is easier to achieve in the physical sciences than in the social sciences and education. Researchers in education, for example, seldom use exactly the same instruments or procedures or time lines that other researchers use; in fact, they often modify the instruments or procedures to fit circumstances unique to their own situation. Subsequent researchers usually try to improve what the first researcher did, but variations in practice always mean that replication does not occur.

Researchers in education try to design studies as carefully as they can, then trust that a number of studies on the same problem area will "add up" over time, even though the various studies were done in different ways. Meta-analysis is one technique that has been developed to increase confidence in generalizations made from a number of different studies without doing replication. Meta-analysis is an important contribution methodologically; it is not replication.

This study describes 144 replications that were conducted in the Phi Delta Kappa Study of Students At Risk (1). The general model used in this study to accomplish simultaneous replication is well known: standardized achievement testing.

Over the years, test publishers have developed instruments, manuals, and experience that allow educators to assess students' academic achievements in widely separated geographical settings. The publishers have standardized testing instruments, instructions, time limits, scoring, and interpretation procedures. Those standardized procedures make it possible for educators to have confidence in the results that achievement testing produces. In this sense, different schools that use the same standardized test to assess their students' achievements actually engage in simultaneous replication, but they seldom view it that way.

Because the instruments produced by the major test publishers are usually developed with great care, because the tests are reliable, because the manuals are explicit, and because the procedures for administering the instruments have been standardized, most people have confidence in the results of such testing. Uniformity, explicitness, reliability, and standardization are the keys.

Those who assumed responsibility for conceptualizing and coordinating the Phi Delta Kappa Study of Students At Risk accepted these characteristics of standardized testing as important qualities to be achieved in data collection and data analysis. Uniformity, explicitness, reliability, and standardization were assumed to be important to the success of the project. Everything was done to achieve those goals.

Accomplishing simultaneous replication by standardizing instruments and procedures was achieved three ways: a manual of instructions was prepared, participants were trained to collect data, and data from 276 schools in 87 communities were analyzed in common ways by one person at one location. (Note: In this paper the number of schools cited varies on occasion because some schools had partial rather than complete data sets and because some replications were eliminated from consideration for technical reasons.) In addition, participants were trained to analyze the data collected in their local schools and to interpret those analyses. Finally, the importance of having volunteers available to collect the data in uniform ways is discussed. Each of these points is described as a factor that made simultaneous replication possible.

A Manual of Instructions Was Prepared: A manual was developed by the coordinating committee during the spring and summer of 1988 (2). The manual was 140 pages long. It was explicit. Every participating chapter of Phi Delta Kappa used the same manual of instructions, and that manual served as a standardizing element--the common denominator--in this research project.

The manual was divided into 13 parts. Each part was labeled a "job". Each job consisted of several "tasks" that had to be accomplished in a particular sequence in order for the job to be completed. The jobs addressed the variable or cluster of variables that comprised the focus of the study (e.g., at risk behavior, holding power of the high school, teachers' descriptions of classroom practice). Each task specified operational procedures, time lines, precise instructions for recording information (i.e., variables that were controlled and variables that were manipulated), and ways to cope with difficulties that might arise in data collection.

After the first draft of the manual was developed, the data-collection portions were field tested in one school. Following that, major modifications were made. The manual was then duplicated, assembled in three-ring binders, and mailed to participating chapters one month before the three-day training session. Participants were directed to read the manual before they came to the training.

Training: Participants met for three consecutive days of training in early October, 1988, and the manual served as a textbook for the training. During the training sessions, each participant spent at least one hour in a small group setting getting detailed instructions about how to do each job. The instructions were conducted by the person who had had primary responsibility for developing that portion of the manual. Discussions centered on the exact wording of the manual, what terms meant, what to do in event of difficulty, and the like.

At the end of the training, minor changes were made in the manual as a result of what had been learned during the training sessions. Each proposed change was discussed at length by the members of the coordinating committee. Changes that were agreed to were then presented to all participants at a final general session, and participants recorded the changes line-by-line in their own manuals. The next week, copies of pages that had been changed were mailed to each participating chapter.

The manual served as a "constant" throughout this study. Following the explicit instructions in the manual, researchers collected data in 276 schools in 87 communities between October 10 and December 15, 1988. Researchers used common definitions and common procedures to collect the data, and data were recorded in uniform ways, all according to the instructions in the manual.

Data Were Analyzed in Common Ways: Most of the data collected in this study were recorded in numeric form. Some of the verbal or non-objective data (e.g., data from case studies that included videotapes and narratives) were handled by rules common for qualitative research.

Student information data forms were completed by researchers who coded information provided by teachers who knew each student best and who had access to each student's records. Those forms were scanned optically, and the resultant data were recorded on computer tapes and organized according to an 80-column format, with the number of lines for each record specified, according to the information to be included at that point in the data file. All data files were chapter (i.e., local) level files. Finally, every data file was visually

scanned to verify that appropriate information was recorded in the appropriate columns and that each record included the appropriate number of lines.

Once the data files were readied, two kinds of analyses were accomplished. In one, the data were aggregated and handled as one data set. In the second, the data were dealt with in disaggregated form, school by school. This paper describes the second set of analyses, referred to here as "simultaneous replication."

For purposes of simultaneous replication, data were analyzed with SPSS/PC+ by running one program that would recode the values, sum scores for various scales, generate descriptive statistics of various kinds, then accomplish stepwise multiple regression with the data from each school, one school at a time. In all, 237 multiple regression analyses were prepared that involved information about students in 237 schools located in 87 communities, although only 144 of those analyses are reported here. Another 254 analyses were accomplished that involved teacher data. This paper describes the results of analyses of student data only. Future papers will describe the results of simultaneous replications involving teacher data.

Standardization of instruments, standardization of time, standardization of data collection procedures, and a standardized computer program meant that simultaneous replication as an idea could be realized. Once the data were collected, they were analyzed on one computer, one school at a time.

This last point--analysis of all data by one person at one place--is a deviation from the idea of replication as that idea is generally practiced in science. That is, even though the same problem was studied in different schools in various communities, the fact that one person analyzed the data for all of the schools may suggest that that one person might err, knowingly or unknowingly. In that way, the confidence that generally accrues to research findings as a result of independent replication was not assured.

To guard against such a possibility, researchers at 19 chapters of Phi Delta Kappa received all of the data sets from all of the chapters. Those researchers were encouraged to analyze the data sets in whatever ways seemed appropriate and reasonable to them. In addition, other people critiqued the process.

Using Volunteers to Collect Data: Phi Delta Kappa is a professional organization. Members regularly contribute their time, money, energy, and talent to further the purposes of the organization: promoting quality education through leadership,

service, and research. The number of people and the amount of time contributed by members of Phi Delta Kappa to assure the completion of this project is described elsewhere (3).

The point is, volunteers made the study possible. Volunteers accepted responsibility for the project in their chapter area. Volunteers spent three days in training learning to accomplish each of the 13 jobs. Volunteers collected data in the schools according to the instructions in the manual. Volunteers spent three additional days in training devoted to data analysis and data interpretation. And all volunteers were professional educators.

Professionals are generally paid for what they do, but members of professional organizations often contribute to those organizations in different ways. Contributions by professional educators made the Phi Delta Kappa Study of Students At Risk possible, and it was those contributions that made simultaneous replication possible. Professionals who contributed their expertise made it possible to collect data in schools in widely separated regions of the United States in common ways.

The Problem

For the purpose of this study, the committee that conceptualized the Phi Delta Kappa Study of Students At Risk assumed that being at risk meant being likely to fail at school or fail at life. This assumption led to four questions that guided the Study of Students At Risk:

1. Who is at risk?
2. What are they like?
3. What are the schools doing to help those students?
4. How effective are those help efforts?

For purposes of analyses reported in this paper, the following questions were posed: Do teachers know who is at risk in their classrooms, and do they provide special help to those students who are most at risk?

Specifically, this hypothesis was tested: There will be a positive relationship between what teachers do and the nature and degree of risk evident in a student's life. In other words, teachers will make special efforts to help students who are at risk.

Procedures

To answer the two questions posed in this study, and to test the hypothesis stated above, data were collected in each of three schools in 86 communities throughout the United States and one community in Canada. The research reported here was part of the larger study, but for the purposes of this paper, six things will be described:

1. developing an instrument to assess at riskness,
2. selecting sites,
3. selecting schools at each site,
4. selecting students at each school,
5. collecting information about students, and
7. analyzing the data.

Developing an Instrument to Assess At Riskness: As described above, this project began with the assumption that a student was at risk if that youngster was likely to fail at school or fail at life. Following the clarification of that assumption, a careful review of the literature was undertaken to verify such a definition and to identify specific conditions that contributed to being at risk. More than 100 studies were examined.

Second, 45 factors that contributed to being at risk were identified from previous research studies and each was specified in operational terms.

Third, a 45-item questionnaire predicated on the factors that contributed to being at risk was developed to verify the factors and to determine each factor's relative importance in the overall scale.

Fourth, 97 experienced educators responded to the questionnaire and indicated their judgment about the relative importance of each factor as contributing to at riskness.

Fifth, the responses of the 97 persons were summed and the 45 items rank-ordered in terms of importance, according to the experienced educators' judgments. A weight was assigned to each of the 45 items that ranged in value from 1 to 5.

Sixth, 13 additional items were developed that described specific classroom activities or practices (not programs) that teachers might use with particular students. Taken together, these 13 items were considered a "School Effort Scale" (i.e., what teachers might do to help students who needed special help).

Seventh, following data collection, and after a careful review and evaluation of all information collected, 31 of the items were grouped to comprise a weighted "Risk Scale," 11 of the 45 items that related to at riskness were grouped together to comprise a weighted "Academic Risk Scale," and three items were eliminated.

In summary, the "Student Information" instrument that served as a basis for the "Risk Scale," "Academic Risk Scale," and "School Effort Scale" consisted of 64 items, all together: 6 demographic items, 45 at risk items, and 13 school effort items. In the final analysis, three of the 45 at risk items were not used in either of the risk scales; they were eliminated from consideration on the basis of empirical data collected in the study.

Scores from three scales--"Risk," "Academic Risk," and "School Effort"--were used in the replications described in this paper. Examples of specific factors (i.e., items) in each scale as they were defined in operational terms are described below.

Items numbered "1" and "4" were included in the "Risk Scale":

1. Father's Occupation

Professional	= 1
Manager, Technician	= 2
Skilled Laborer	= 3
Unskilled Laborer	= 4
Househusband	= 5
Unemployed	= 6

4. Mother's Level of Education

Did not graduate from high school	= 1
Graduated from high school only	= 2
Finished 1-3 years post-secondary	= 3
Graduated from college	= 4
Did post-graduate work	= 5

Items numbered "13", "22", and "23" were included in the "Academic Risk Scale":

13. Student's scores on norm-referenced
standardized achievement tests in Reading

Below 20th percentile	= 1
Between 21st and 40th percentile	= 2
Between 41st and 60th percentile	= 3
Between 61st and 80th percentile	= 4
Over 80th percentile	= 5

22. Teacher's estimate of the student's
sense of self esteem

Very negative	= 1
Negative	= 2
So-So/In Between	= 3
Positive	= 4
Very positive	= 5

23. Average grades student received last year

F	= 0
D	= 1
C	= 2
B	= 3
A	= 4

Items numbered "46" and "52" were included in the "School Effort Scale":

46. Was this student placed in a class that was smaller than typical for instructional purposes?

No	= 0
Yes	= 1

52. Has the school provided tutoring or other
special assistance to this student?

No	= 0
Yes	= 1

Selecting Sites: Phi Delta Kappa is an international organization of professional educators with chapters located in 640 communities throughout the world. Most of the chapters are located within continental United States. In February, 1988, Phi Delta Kappa issued a Request for Proposals (RFP) to each of its 640 chapters inviting them to engage in a collaborative project: A Study of Students At Risk. The RFP stipulated that

funds were available for up to 100 chapters to participate and that each proposal received would be judged on the basis of the level of expertise of the local researchers, commitment to the project (including willingness to assume certain costs), and indications of access to the schools and community.

Proposals were received from 240 chapters. A special committee of Kappans was convened to evaluate the proposals. On the basis of that evaluation, 100 chapters were selected to participate and 140 chapters were notified that their proposals had been rejected. The 100 chapters selected were located in 39 states in the United States and one province in Canada.

No effort was made to guarantee that the chapters selected were representative of the nation as a whole, only that they would be able, willing, and committed to the idea of doing a collaborative study with other chapters. Kerlinger's comments seem appropriate here:

There are experts who insist on random sampling as a condition of the validity of the theory--and they are correct. But if the theory is forbidden to us with nonrandom samples, much use of statistics and the inferences that accompany statistics would have to be abandoned. The reality is that the statistics seem to work very well even with nonrandom samples--provided the researcher knows the limitations of such samples, is even more careful than he would be with random samples, and replicates his studies. (emphasis added) (4)

Kerlinger's discussion of the law of large numbers adds further to his comments regarding sampling:

The law of large numbers . . . says that as you increase the size of samples, you also decrease the probability that the observed value of an event, A, will deviate from the "true" value of A by no more than a fixed amount, k. Provided the members of the samples are drawn independently, the larger the sample the closer the "true" value of the population is approached. (5)

The following statement appeared in the Manual of Instructions that all chapters used to guide their data collection efforts:

Because this project is being done by chapters that volunteered to participate, we will not be able to justify our sample of schools or students as "representative" or "random" in the statistical sense of those terms. We will not be able to make statistical inferences from the data and generalize to the population as a whole.

In other words, the procedures used to select chapters to participate in this project precluded the possibility of producing an aggregated data set that would be representative of the total population. Instructions to researchers at the chapter level, however, directed them to select schools that would assure representativeness of their communities.

Selecting Schools at Each Site: The Manual of Instructions directed each local research committee to select three schools. The specific instructions are described below:

The job here is to select three schools in your chapter's geographical area: one elementary level school, one junior high or middle level school, and one senior high school. To select these three schools, you must accomplish six tasks. The tasks are described below:

1. assemble your research committee
2. define the area served by your chapter
3. review the characteristics of the area
4. select three schools that represent the area
5. describe how you select the three schools
6. send names of superintendents to PDK

It was assumed that experienced professionals, working together, could make valid judgments about various factors involved in studying students at risk. Each member of the local research committee was directed to "read these instructions carefully, then discuss each point until you reach consensus regarding what you are going to do."

In defining the area served by each chapter, local researchers were asked to attend to the following kinds of considerations: size of the geographical area served by the chapter, how many school districts were included within that area, and approximately how many school buildings were included. Further instructions are described below:

Consider the characteristics of the various school districts that make up your area: size of districts, number of buildings, age of

buildings, nature of programs, number and type of students served, and the age and experience of faculty members. Consider the traditions, philosophies, leadership, financial support, and other resources available to the schools.

Consider also the demographic factors and changes that have occurred in your community in recent years; consider the racial and cultural diversity present. Also consider the economic and social factors that manifest themselves in the community: employment opportunities, wages, industries, housing, transportation, communication, and government.

Further consider the liabilities evident in the area: any deterioration of various segments of the community, debt, unemployment, morale, degree and nature of racial/ethnic conflict, and the like. . . .

After meeting together as a committee, reviewing this document carefully and thoughtfully, and examining the ramifications inherent in the five criteria specified below, select three schools that are representative of the area your chapter serves. The key word is "representative": the schools that you select should be representative of the area as a whole.

For example, if your chapter serves a metropolitan area that includes a large urban school district surrounded by several suburban districts, do not select three schools from the suburban districts and do not select three schools from the large urban district. Consider the percentage of students in the largest district in comparison to the percentage of students in the other districts. Typically, that would mean no more than one school per district, but that is not a "hard" rule. Make every effort to select three schools that represent the area as a whole. (6)

Five criteria for selecting schools were specified. The schools should be: public, include appropriate grade levels, culturally and geographically diverse, and accessible. Further, researchers were directed not to select special schools of any kind (e.g., magnet schools, vocational schools, schools for the retarded, or schools that serve only delinquent or incorrigible youth).

Selecting Students At Each School: Researchers at each site collected data on approximately 100 students at one grade level in each of the three schools selected for inclusion in the study: fourth grade, seventh grade, and tenth grade. The local researchers studied students who were in intact groups, wherever possible, and groups in which students were generally thought of as "typical" for that school. They did not study students who were in special education classrooms, alternative schools, or other special situations.

The local Phi Delta Kappa research team met with teachers and others who knew the students best, and those building professionals provided specific information to the researchers regarding each of the factors involved.

Collecting Data About Students: Researchers at each local site scheduled a meeting with teachers and others who were most knowledgeable about the students involved. Students were assigned ID numbers, and information about the students was recorded in terms of ID numbers only. The school maintained a list of names and ID numbers. Specific instructions, as stated in the manual, are described below:

The people with whom you meet must have access to the students' cumulative folders, and they must have access to such things as attendance data, achievement data, family situation, and the like. The Phi Delta Kappa research team will not need to have direct access to that information, but the teachers and others in the building must be able to provide information to the research team that is accurate and current.

The instructions continued:

The teachers and others who know the student well should check the records and provide information. The PDK research team should process the discussion, ask helpful questions, and record the information provided on the answer blank . . . If the information is not available, leave that space unmarked on the answer blank. (7)

It should be pointed out that the teachers who worked directly with the students being studied and knew each student well and who had access to each student's records provided information to the research team regarding 64 different questions, one student at a time. Six of the questions

referred to demographic factors: date of birth, sex, race, and the like. The next 45 questions asked for information about areas that previous research suggested were related to at riskness: parents' level of education and employment, number of siblings who had dropped out of school, scores on achievement tests, grades, attendance, and the like. The last 13 questions referred specifically to classroom practices that may or may not have been made available to the particular youngster about whom information was being provided: assigning extra homework to the student, making special instructional materials available to the student, referring the student to a school psychologist or school social worker, and the like.

At no point in the data collection process was the student referred to as "at risk" or in need of special help of any kind. In fact, since the students selected for inclusion in the study were "typical" students, most of the information collected was assumed to be characteristic of "normal" students rather than students who were thought to be "at risk".

Analyzing the Data: As described before, information about students that was provided by the teachers who knew the students best was analyzed two ways: by site, and aggregated for all sites combined. In the research reported here, 237 separate analyses of the data were accomplished--one analysis for each of the schools at each site. It was finally decided that 144 of the 237 data sets were usable, and this paper reports analyses of data for those 144 schools.

It was assumed that the teachers who provided student information had access to the most accurate, current data about each student and knew each student well, therefore it was also assumed that the information was both valid and reliable. And when good information was not available (i.e., the teacher "did not know"), that item was left "blank" by the recorders. For the purpose of the analyses reported here, those items that were left "blank" were treated as "0" in the computations.

Using SPSS/PC+ on a personal computer, a special program was prepared that accomplished several things. Each of the 42 (of the original 45) at risk items that was included in the "Risk Scale" and "Academic Risk Scale" was recoded to reflect the relative weighting that had been accorded as a result of the subjective judgments of 97 experienced educators, as described above. Missing values (i.e., "do not know" responses by the teachers) were recoded "0". Then, weighted scores of the 31 "Risk Scale" items were summed, weighted scores of the 11 "Academic Risk Scale" items were summed, and unweighted scores of the 13 "School Effort Scale" items were summed for each student in each school.

Following that, descriptive statistics for the three scales were computed. Finally, using the stepwise multiple regression procedure, multiple R, adjusted R squared, F value, and significance levels were calculated between "Risk Scale," "Academic Risk Scale," and "School Effort Scale" scores. The "School Effort Scale" was specified as the dependent variable, assuming that what teachers did to help students would be a function of the extent to which students were seen to be at risk by the teachers who knew them best.

The program, as described, was run for each of the 237 schools in the 87 communities. In those instances in which more than 10 percent of the recorded values on the "School Effort Scale" were "0", it was considered inappropriate to include such schools in the computations, thus the number of replications was reduced from 237 to 144.

For example, in school number 0152, teachers reported that they "did not know" regarding any of the "School Effort Scale" items for 91 of the 132 seventh graders about whom information was being collected. That school was dropped from the replication analyses reported here. Results of the 144 replications that were accomplished are described below, by grade level.

Results

The results of the multiple regression procedure as obtained in 144 replications in 144 different schools are reported below. All results are reported by grade level.

Table 1 depicts the results of analyses obtained in 59 elementary schools. Table 2 describes the results obtained in 50 junior high schools. Table 3 describes the results obtained in 35 senior high schools.

In all tables, the "No. 0's" refers to the number of students for whom teachers reported "No" or "do not know" to the "School Effort" questions. Recall that in those schools in which 10 percent or more of the cases were 0's, such schools were eliminated from the study.

Table 1

Relationships Between Risk, Academic Risk, and School Effort Scores
59 Replications Grade Four

Repli- cation	Site	Mul R	Adj R Sq	F	Sig	Variables Entered	N	No. 0's
1	0009	.54	.27	20.86	.001	Acar	54	0
2	0016	.54	.29	41.57	.001	Acar	101	0
3	0026	.37	.13	16.02	.001	Acar	105	2
4	0028	.44	.17	8.09	.01	Acar	36	0
5	0033	.33	.10	10.31	.01	Acar	88	4
6	0034	.58	.33	35.61	.001	Acar	71	0
7	0042	.63	.38	24.60	.001	Acar	39	3
8	0050	.57	.31	45.63	.001	Acar	99	1
9	0051	.61	.35	15.20	.001	Acar	27	0
10	0054	.44	.19	103.31	.001	Acar	433	37
11	0058	.80	.63	62.79	.001	Acar	38	0
12	0059	.48	.22	16.42	.001	Acar	57	1
13	0064	.51	.25	25.32	.001	Acar	75	0
14	0066	.48	.21	13.61	.001	Risk Acar	94	0
15	0067	.56	.30	16.85	.001	Acar	38	0
16	0071	.43	.17	21.39	.001	Acar	98	5
17	0080	.42	.17	20.07	.001	Acar	95	0
18	0082	.56	.29	13.42	.001	Acar	32	0
19	0090	.65	.41	57.51	.001	Acar	82	0
20	0098	.65	.42	37.52	.001	Acar	52	0
21	0116	.59	.29	5.92	.01	Risk Acar	25	0
22	0128	.43	.18	22.35	.001	Acar	99	1
23	0132	.62	.37	29.14	.001	Acar	48	3
24	0136	.54	.26	10.05	.001	Risk Acar	52	0
25	0141	.40	.15	18.78	.001	Acar	98	3
26	0152	.48	.22	19.56	.001	Acar	68	0
27	0158	.28	.07	7.94	.01	Acar	99	0
28	0171	.38	.14	16.38	.001	Acar	98	3
29	0190	.73	.52	79.01	.001	Acar	72	0
30	0197	.59	.32	14.09	.001	Risk Acar	57	0
31	0210	.60	.35	37.40	.001	Acar	69	0
32	1014	.58	.33	40.29	.001	Acar	80	0
33	1031	.42	.16	19.90	.001	Acar	97	0
34	1052	.30	.08	8.63	.01	Acar	89	3
35	1070	.48	.20	7.44	.01	Risk Acar	52	0

(continued next page)

Table 1 (continued)

Relationships Between Risk, Academic Risk, and School Effort Scores
59 Replications Grade Four

Repli- cation	Site	Mul R	Adj R Sq	F	Sig	Variables Entered	N	No. 0's
36	1076	.59	.34	31.75	.001	Acar	62	1
37	1079	.68	.44	18.38	.001	Acar	23	1
38	1108	.70	.48	68.95	.001	Acar	75	0
39	1110	.57	.31	46.52	.001	Acar	101	0
40	1142	.60	.34	26.68	.001	Risk Acar	99	4
41	1143	.56	.30	43.64	.001	Acar	99	1
42	1181	.82	.66	98.49	.001	Risk Acar	100	0
43	1191	.32	.09	6.05		Acar	55	0
44	1204	.62	.37	27.04	.001	Risk Acar	89	5
45	1207	.53	.26	15.62	.001	Acar	42	0
46	1234	.39	.13	6.76	.01	Acar	40	1
47	1309	.74	.53	36.35	.001	Acar	32	1
48	1323	.70	.48	83.97	.001	Acar	91	0
49	1339	.32	.08	3.68		Acar	34	0
50	1353	.32	.09	10.93	.001	Acar	98	6
51	1363	.31	.08	6.23	.01	Acar	63	0
52	1410	.60	.35	35.93	.001	Acar	65	2
53	1422	.45	.19	19.75	.001	Acar	81	5
54	1435	.49	.23	23.34	.001	Acar	76	0
55	1441	.63	.32	5.30		Risk Acar	19	0
56	1471	.72	.51	61.11	.001	Acar	59	0
57	1480	.60	.35	39.18	.001	Acar	73	0
58	1499	.49	.23	15.71	.001	Acar	51	0
59	1523	.38	.12	6.18	.01	Risk Acar	75	0

Table 2

Relationships Between Risk, Academic Risk, and School Effort Scores
50 Replications Grade Seven

Repli- cation	Site	Mul R	Adj R Sq	F	Sig	Variables Entered	N	No. 0's
1	0009	.73	.53	106.80	.001	Acar	94	0
2	0016	.58	.32	24.78	.001	Risk Acar	101	5
3	0026	.65	.42	77.96	.001	Acar	108	0
4	0033	.32	.09	10.82	.001	Acar	99	0
5	0034	.55	.29	41.54	.001	Acar	100	0
6	0050	.59	.34	53.52	.001	Acar	101	0
7	0051	.48	.23	28.83	.001	Acar	96	0
8	0058	.55	.30	42.35	.001	Acar	99	6
9	0059	.68	.46	76.32	.001	Acar	91	1
10	0064	.61	.36	55.70	.001	Acar	98	0
11	0071	.23	.04	5.55	.01	Acar	104	0
12	0073	.59	.34	27.70	.001	Acar	54	0
13	0080	.37	.13	14.26	.001	Acar	92	1
14	0090	.58	.33	37.38	.001	Acar	74	3
15	0098	.58	.33	50.32	.001	Acar	99	1
16	0105	.72	.51	104.28	.001	Acar	101	0
17	0106	.66	.43	68.61	.001	Acar	92	4
18	0128	.72	.50	40.63	.001	Acar	40	0
19	0132	.42	.16	10.22	.01	Acar	50	0
20	0133	.58	.33	54.10	.001	Acar	107	5
21	0136	.65	.41	34.27	.001	Acar	49	0
22	0158	.10	.00	1.01		Acar	100	0
23	0190	.69	.47	50.33	.001	Risk Acar	111	1
24	0210	.57	.32	24.38	.001	Risk Acar	102	2
25	1016	.37	.10	4.20		Acar	29	0
26	1031	.52	.26	35.82	.001	Acar	100	0
27	1035	.55	.29	41.60	.001	Acar	99	6
28	1070	.55	.29	26.86	.001	Acar	64	0
29	1076	.72	.51	105.34	.001	Acar	100	0
30	1092	.44	.19	28.95	.001	Acar	124	1
31	1108	.68	.46	84.19	.001	Acar	99	1
32	1110	.45	.20	24.21	.001	Acar	95	0
33	1142	.52	.27	39.19	.001	Acar	106	0
34	1191	.18	.02	3.00		Acar	97	0
35	1204	.47	.22	55.27	.001	Acar	192	4

(continued next page)

Table 2 (continued)

Relationships Between Risk, Academic Risk, and School Effort Scores
50 Replications Grade Seven

Repli- cation	Site	Mul R	Adj R Sq	F	Sig	Variables Entered	N	No. 0's
36	1207	.44	.19	39.37	.001	Acar	168	0
37	1221	.60	.36	56.27	.001	Acar	100	3
38	1234	.60	.36	52.19	.001	Acar	93	9
39	1309	.34	.10	9.00	.001	Risk Acar	140	0
40	1316	.74	.54	63.13	.001	Risk Acar	107	0
41	1323	.37	.12	7.41	.001	Risk Acar	99	0
42	1339	.54	.28	19.65	.001	Acar	50	0
43	1366	.80	.63	127.95	.001	Acar	76	0
44	1388	.41	.16	17.38	.001	Acar	90	0
45	1393	.63	.39	61.00	.001	Acar	95	2
46	1410	.61	.36	29.90	.001	Risk Acar	106	7
47	1435	.32	.08	5.38		Acar	49	0
48	1442	.58	.33	26.45	.001	Risk Acar	105	0
49	1478	.37	.12	7.70	.001	Risk Acar	100	3
50	1480	.43	.16	8.89	.001	Risk Acar	81	0

Table 3

Relationships Between Risk, Academic Risk, and School Effort Scores
35 Replications Grade Ten

Repli- cation	Site	Mul R	Adj R Sq	F	Sig	Variables Entered	N	No. 0's
1	0028	.16	.01	2.20		Risk	83	2
2	0042	.52	.24	9.44	.001	Risk Acar	55	0
3	0050	.56	.30	21.36	.001	Risk Acar	96	0
4	0059	.01	.00	.02		Risk	93	0
5	0064	.47	.21	13.95	.001	Risk Acar	99	4
6	0066	.66	.42	36.53	.001	Risk Acar	100	0
7	0071	.65	.42	49.03	.001	Acar	68	1
8	0073	.40	.14	8.79	.001	Risk Acar	98	0
9	0080	.35	.11	13.24	.001	Acar	99	7
10	0090	.37	.12	6.76	.01	Risk Acar	87	0
11	0105	.30	.08	7.73	.01	Acar	81	0
12	0128	.73	.52	70.72	.001	Acar	65	1
13	0148	.31	.07	4.27		Risk Acar	84	4
14	0158	.31	.07	5.05	.01	Risk Acar	101	0
15	0171	.34	.11	12.69	.001	Acar	100	6
16	0197	.43	.18	22.21	.001	Acar	99	0
17	0210	.63	.40	64.94	.001	Acar	99	0
18	1014	.44	.19	26.47	.001	Acar	110	1
19	1070	.47	.21	17.79	.001	Risk Acar	130	1
20	1092	.63	.38	27.81	.001	Acar	44	3
21	1108	.53	.26	16.61	.001	Risk Acar	89	0
22	1143	.60	.35	55.52	.001	Acar	101	0
23	1181	.69	.48	78.35	.001	Acar	86	0
24	1183	.56	.31	52.40	.001	Acar	117	3
25	1207	.75	.55	105.54	.001	Acar	86	0
26	1309	.59	.33	26.63	.001	Risk Acar	103	4
27	1316	.04	.00	.12		Risk	82	0
28	1339	.66	.43	48.28	.001	Acar	63	0
29	1366	.22	.04	3.96		Acar	81	5
30	1388	.68	.45	28.94	.001	Acar	35	0
31	1410	.61	.36	48.89	.001	Acar	85	0
32	1442	.51	.25	18.11	.001	Acar	53	0
33	1471	.69	.48	102.70	.001	Acar	112	1
34	1480	.17	.02	2.59		Acar	84	0
35	1499	.05	.00	.13		Acar	50	0

Discussion

The general question that guided this research was: Do teachers know who is at risk in their classrooms, and do they provide special help to those students who are at risk?

The data in these replications indicate clearly that the answer to this question is "yes".

In 129 of the 144 replications, the relationships between school effort and risk were statistically significant. In only 15 replications were the correlation coefficients not significant statistically. The pattern was very clear. One has to assume that where special school efforts were being provided, teachers were making those provisions on the basis of their awareness of who was at risk.

The hypothesis that teachers will make special efforts to help students who are at risk was supported. However, since 101 of the 144 replications indicated statistically significant relationships between "School Effort" and "Academic Risk" scores, 28 replications indicated statistically significant relationships between "School Effort" and both "Risk" and "Academic Risk" scores, and 15 replications indicated that no relationships were significant statistically, general support for the hypothesis must be qualified.

In addition, the data reported here suggest that schools do not always have information that would be helpful to work effectively with students who are at risk. Furthermore, teachers often do not even know which specific teaching practices are being used with particular students in their own school. And the problem seems to be more serious at the secondary level.

At the elementary and middle school level, the most common response of teachers seems to be to "academic risk" concerns rather than "risk" more broadly defined. For example, at the elementary level, 47 of the 59 replications reported here produced multiple R values that were significant statistically in which "Academic Risk Scale" scores related to "School Effort Scale" scores but "Risk Scale Scores" had been removed from the equation. At the middle school level 36 of the 50 replications produced similar results.

At the senior high school level, there is some evidence that teachers may be responding to risk more broadly defined than teachers at the elementary or middle school level.

In an overall sense, approximately two-thirds of the 144 replications reported here resulted in multiple R values in which "Academic Risk Scale" scores correlated at a statistically significant level with "School Effort Scale" scores, but "Risk Scale Scores" had been removed from the equation. That means, by definition, that in one-third of the schools something else was operating. The only safe conclusion one can draw from such data is that "each situation is unique." As Gastright pointed out in his comparison of local data and national data, "Don't base your dropout program on somebody else's problem." (8)

Simultaneous replication enables people at the local level to make the most of their own data rather than be influenced by data that have been aggregated and summarized for a larger but non-local population. The methodology gives people control over their own data, including its use and its interpretation, and thus their own destiny.

In the long run, validating some form of an "At Risk Scale" with longitudinal data must be attempted. Additional factors can be added to the 42 reported in this study (e.g., working after school), but by identifying students with particular characteristics (e.g., students who were retained in grade one or more times or who exhibited a pattern of characteristics thought to contribute to at riskness) in specific schools, and studying the precise factors evident in their situation, then checking to see whether similar evidence shows up in other children's lives in other schools, we should be able to resolve a vexing educational problem.

As a research methodology, simultaneous replication seems particularly suited to school districts and professional organizations. The methodology is both possible and practical, when research is conceived and conducted within an organizational framework that includes centralized and decentralized governance units that can expedite communication and coordinate activities.

Organizations that want to use simultaneous replication would find the technique most effective if they had sub-units that were separated geographically, a central headquarters with communication and dissemination capabilities, agreement on the common purpose of the organization, and a commitment to research as one way to attain the purpose.

For example, if a professional organization or school district could agree upon one or more research questions, the organization or district could use the approach outlined here as a way to collect data in dozens or hundreds of schools or communities simultaneously to answer the question or questions posed. Instead of waiting years or even decades to answer

important questions, the entire activity could be accelerated and results produced in months, and in ways that guarantee confidence in the final results. Furthermore, research costs could be reduced dramatically.

The idea of simultaneous replication as a way of doing large-scale research was tested in the Phi Delta Kappa Study of Students At Risk by subjecting data that were collected in common ways with common instruments in 87 separate sites to common analytic procedures. The test was successful. The idea works. Future reports will describe other replications.

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